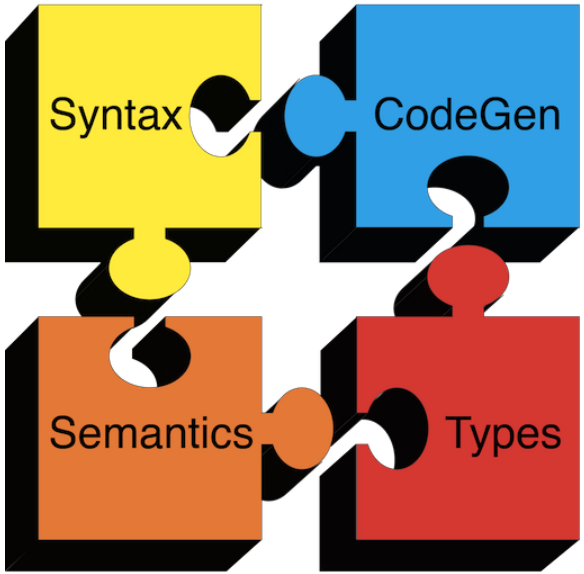


Compilers

Java Arrays

Java Arrays

Assume B < A. What happens in the following?

```
B[] b = new B[10];
A[] a = b;

a[0] = new A();
b[0].aMethodNotDeclaredInA();
```

Java Arrays

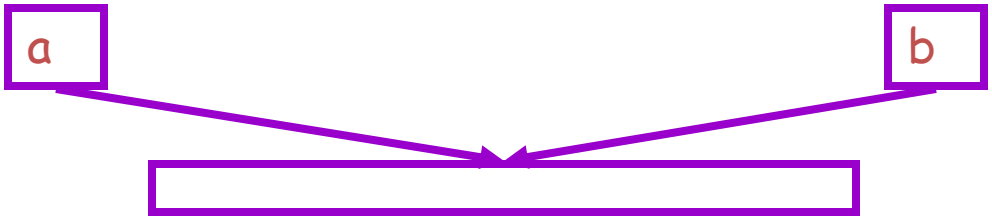
B < A if B inherits from A as in Cool

C < A if C < B and B < A as in Cool

B[] < A[] if B < A not as in Cool

Java Arrays

```
B[] b = new B[10];
A[] a = b;
a[0] = new A();
b[0].aMethodNotDeclaredInA();
```



Having multiple aliases to updateable locations with different types is unsound!

Java Arrays

- Standard solution
  - Disallow subtyping through arrays

B < A if B inherits from A

C < A if C < B and B < A

B[] < A[] if B = A

Java Arrays

- Java fixes the problem by checking each array assignment at runtime for type correctness
  - Is the type of the object being assigned compatible with the type of the array?
- Adds overhead on array computations
- But note: arrays of primitive types unaffected
  - Primitive types are not classes